

5
NON-PROVISIONAL APPLICATION FOR LETTERS PATENT
UNITED STATES OF AMERICA

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Be it known that I, David Douglas Briick, residing at 5365
15 Punkintown Road, Douglasville, Georgia, 30135, a citizen of the
United States, have invented certain new and useful improvements in a

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MOTOR VEHICLE VERIFICATION AND CONTROL SYSTEM

of which the following is a specification.

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MOTOR VEHICLE VERIFICATION AND CONTROL SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

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To the full extent permitted by law, the present application claims priority to and the benefit as a non-provisional application
10 to provisional patent application entitled "Motor Vehicle Verification and Control System" filed on August 26, 2002, having assigned Serial No. 60/405,955.

TECHNICAL FIELD

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The present invention relates generally to remote vehicle sensing devices and, more specifically, to a motor vehicle verification and control system having a remote activator capable of locating, monitoring and disabling an equipped vehicle, having a
20 receiver for analog, digital, broadband, satellite (i.e. GPS) and/or infrared signal technologies, having a remote infrared target for disabling an equipped vehicle, having an interactive license plate coupled with a remote infrared target for vehicle-disabling means, and having a license scanner enabling law
25 enforcement to regulate the speed, operation and traveling distance of a vehicle.

BACKGROUND OF THE INVENTION

Vehicle ownership enables an individual to freely move from
5 place to place. The price of such freedom includes legal and
financial responsibilities. Unfortunately, drivers frequently
operate vehicles without a valid license. Even more prevalent is the
number of uninsured drivers. These factors contribute to health care
costs and insurance premiums that are often prohibitive and thus
10 financially preclude some individuals from owning and/or operating a
car.

Vehicle theft also continues to be a problem, especially in
concentrated urban areas. Although law enforcement authorities
15 police the roads, they must rely on information from vehicle
registration, licensing and renewal processes that are largely
antiquated, thereby further hindering successful location of a
missing vehicle. However, to assist in location of such missing
vehicles, global positioning systems (GPS) are utilized to determine
20 the location of a vehicle equipped with a global positioning device.

Unfortunately, upon discovering a stolen vehicle, officers must
often participate in dangerous and potentially deadly high-speed
chases to retrieve the vehicle. Recognizing the need to decrease or

eliminate the number of high-speed chases, devices have been proposed to remotely disable a vehicle. Some such devices are installed in a vehicle and can be activated by appropriate authorities via radar or GPS to disable a vehicle, or can be remotely disabled through the use
5 of analog and/or digital signals.

Instead of aiding in locating or disabling a stolen vehicle, other alternatives may perform as a means of theft prevention, wherein a user's driver's license includes prerecorded/precoded
10 information regarding the authorized drivers of a particular vehicle and an on-board scanner that reads the license to enable or prohibit operation of the vehicle. Such "smart-card" technology limits a vehicle's use to authorized users only. Another type of smart-card, wherein information regarding a user's motor vehicle registration,
15 driver's license, insurance, violations and/or vehicle inspection is accessible via scanning, could be helpful in the event of a police stop.

Each of the aforementioned devices are disadvantageous in view
20 of the present invention because law enforcement officials are limited to gathering information on an individual or on the whereabouts of a vehicle, and to fully disabling a vehicle. Problem drivers such as, for exemplary purposes only, habitual speeders, probationers with limited mobility rights or others whose driving

needs to be limited, monitored or otherwise controlled, but not completely prevented, are unable to be addressed with presently available devices.

5 Therefore, it is readily apparent that there is a need for a motor vehicle verification and control system that provides a remote activator capable of locating, monitoring and disabling an equipped vehicle, a receiver for analog, digital, broadband, satellite (i.e. GPS) and/or infrared signal technologies, a remote
10 infrared target for disabling an equipped vehicle, an interactive license plate coupled with the remote infrared target for disabling means, and a license scanner that enables law enforcement authorities to regulate the speed, operation and traveling distance of a vehicle, thus preventing the above-discussed disadvantages.

BRIEF SUMMARY OF THE INVENTION

15 Briefly described, in a preferred embodiment, the present invention overcomes the above-mentioned disadvantages, and meets the
20 recognized need for such a device, by providing a transportation information and control system having physical components for controlling, tracking or disabling a vehicle, computer technologies for operating the physical components and a delivery system for receiving and transferring information and commands from remote

sources, such as, for exemplary purposes only, analog, digital, broadband, satellite, green light and/or infrared technologies.

According to its major aspects and broadly stated, the present invention is a vehicle authority device enabling law enforcement officials and other appropriate authorities to locate, disable, monitor or control a motorized vehicle from a remote position, wherein a computerized receiver or brain is connected to a vehicle's master computer enabling receipt of signals such as, for exemplary purposes only, analog, digital, broadband, satellite, green light and/or infrared signals broadcasted by an authority figure, and wherein resulting interpretation of the signal enables locating or disabling of the vehicle. The device also incorporates an interactive license plate into the system, wherein the license plate serves as a remote infrared target for disabling a vehicle, and a driver's license scanner, wherein a smart-card license is preprogrammed by authorities to identify a driver and control the speed, operation and geographical boundaries of travel for an individual.

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More specifically, the present invention is a multi-component verification and control system for motor vehicles, wherein an on-board microprocessor and receiver is installed and communicatively linked to a vehicle's master computer. The on-board microprocessor

and receiver, or computer brain, receives remotely generated and preferably encrypted signals such as, for exemplary purposes only, analog, digital, G3, broadband, satellite, green light and/or infrared signals, and interprets the signals to determine the time
5 line for operation of a vehicle, wherein operation of a vehicle may continue, uninterrupted, until expiration of the time line or until intervention by a monitoring agency, wherein the vehicle master computer becomes a slave, overwritten and controlled by the system computer brain, and may be remotely monitored or disabled.

10

A target for receiving signals from an infrared digital device may be installed on an exterior surface of an equipped vehicle, wherein disabling infrared signals may be sent thereto from a helicopter or other air support vehicle. The target can also
15 activate remote devices such as, for exemplary purposes only, traffic monitoring cameras, thereby notifying appropriate authorities of a violation.

An on-board display and scanner module may be utilized to enable
20 a monitoring agency to obtain information regarding a vehicle operator via direct scanning of his or her driver's license, enabling remote restriction of vehicle operation or performance, as necessary. The display module provides authorities with safe and direct contact with a vehicle operator and the scanner module enables receipt of

credit cards for payments of tolls, fines, parking fees and other charges. In addition, the module enables an owner to selectively limit operation of his vehicle to specific individuals, a limited geographic area, a limited operational period, or limited speeds.

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The on-board microprocessor and receiver, or computer brain, may be communicatively linked to a specifically encoded, interactive license plate enabling direct disablement of an equipped vehicle via a remote infrared target and enabling indirect disablement of an equipped vehicle via the unique code. An auxiliary license plate may also be provided, wherein commercial carriers can remotely communicate data such as, for exemplary purposes only, weight, cargo, destination and originator. A towing module may also be incorporated, wherein a monitoring agency may be notified of any unauthorized towing and wherein a trailer towed by an equipped vehicle can be monitored. Safety features incorporated into the multi-component motor vehicle verification and control system include automatic deactivation following tampering with any component thereof.

20

The multi-component motor vehicle verification and control system includes monitoring agency software for controlling transmission and receipt of encrypted data such as, but not limited to, vehicle registration data, outstanding fees and fines, driver

information, insurance details and vehicle tracking data. The software interprets the information received and determines an appropriate course of action. A limited function, secondary device could be provided to enable vehicle tracking and means of direct
5 notification to a monitoring authority of unauthorized operation or other inappropriate actions. Such secondary devices could be utilized by corporations, lien holders, insurers, car rental agencies and other appropriately interested parties.

10 In addition, the multi-component motor vehicle verification and control system could provide an authoritative monitoring agency with a source of revenue, wherein rights can be licensed for the manufacture of compatible peripheral devices such as, for exemplary purposes only, traffic cameras, speed and toll devices and of
15 potentially integrated components such as, for exemplary purposes only, personal data assistants, cellular telephones and other wireless telecommunications devices.

A feature and advantage of the present invention is the
20 ability of such a device to provide remote locating, monitoring, controlling and disabling of an equipped vehicle.

A feature and advantage of the present invention is the ability of such a device to enable mobile receipt of analog,

digital, broadband, satellite (i.e. GPS) and/or infrared signal technologies.

5 A feature and advantage of the present invention is the ability of such a device to provide an interactive license plate acting as a remote infrared target.

10 A feature and advantage of the present invention is the ability of such a device to enable law enforcement to regulate the speed, operation and location limits of a vehicle.

15 A feature and advantage of the present invention is the ability of such a device to prohibit operation of a vehicle by an unlicensed driver.

A feature and advantage of the present invention is the ability of such a device to prevent operation of a motor vehicle by an uninsured driver.

20 A feature and advantage of the present invention is the ability of such a device to prevent operation of a motor vehicle by criminals, including, but not limited to, bail jumpers, individuals who fail to pay child support and/or criminals who have warrants out for their arrest.

A feature and advantage of the present invention is the ability of such a device to provide law enforcement with up-to-date information on vehicle registration, licensing and status.

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A feature and advantage of the present invention is the ability of such a device to enable law enforcement officials to remotely regulate and limit the vehicle operation specifications for habitual speeders.

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A feature and advantage of the present invention is the ability of such a device to enable law enforcement officials to remotely regulate and limit the geographic specifications for vehicle operation by probationers with limited mobility rights.

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A feature and advantage of the present invention is the ability of such a device to enable control over the operation of a motorized vehicle from a remote position.

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A feature and advantage of the present invention is the ability of such a device to limit the operation of a vehicle to a particular time period.

A feature and advantage of the present invention is the ability

of such a device to receive signals from an air support vehicle to effectively disable a motor vehicle.

A feature and advantage of the present invention is the ability
5 of such a device to activate remote devices such as, for exemplary purposes only, traffic monitoring cameras, thereby notifying appropriate authorities of a violation.

A feature and advantage of the present invention is the ability
10 of such a device to enable remote restriction of vehicle operation or performance, as necessary.

A feature and advantage of the present invention is the ability
of such a device to provide authorities with a means of safe and
15 direct contact with a vehicle operator.

A feature and advantage of the present invention is the ability
of such a device to enable law enforcement officials to remotely
issue fines, parking fees, and/or other traffic violation charges to
20 a vehicle operator without having to leave the safety of their law enforcement vehicles and/or station.

A feature and advantage of the present invention is the ability
of such a device to enable in-car, on-board payment of tolls, fines,

parking fees and other charges.

A feature and advantage of the present invention is the ability of such a device to enable a vehicle owner to selectively limit
5 operation of his vehicle.

A feature and advantage of the present invention is the ability of such a device to enable commercial carriers to remotely communicate data such as, for exemplary purposes only, weight, cargo,
10 destination and originator.

A feature and advantage of the present invention is the ability of such a device to prevent unauthorized towing of a vehicle.

15 A feature and advantage of the present invention is the ability of such a device to be adjusted/modified to accommodate any type of motored and/or non-motored vehicle, including, but not limited to, motorcycles, scooter, cars, trucks, motor boats, boat homes, any uni/multi-wheeled vehicles and/or bicycles.

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These and other objects, features and advantages of the invention will become more apparent to one skilled in the art from the following description and claims when read in light of the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be better understood by reading the
5 Detailed Description of the Preferred and Alternate Embodiments with
reference to the accompanying drawing figures, in which like
reference numerals denote similar structure and refer to like
elements throughout, and in which:

10 **FIG. 1** is a pictorial overview of a motor vehicle verification
and control system according to a preferred embodiment of the present
invention, showing an equipped vehicle, a monitoring authority and
wireless communication support equipment.

15 **FIG. 2** is a diagram of the motor vehicle verification and
control system of **FIG. 1**, showing the relationship of auxiliary
components to an auto computer.

20 **FIG. 3** is a diagram of the motor vehicle verification and
control system of **FIG. 1**, showing features of support software.

FIG. 4 is a diagram of the motor vehicle verification and
control system of **FIG. 1**, showing related services provided thereby
and representative users thereof.

DETAILED DESCRIPTION OF THE PREFERRED AND ALTERNATE EMBODIMENTS

In describing the preferred and alternate embodiments of the
5 present invention, as illustrated in **FIGS. 1-4** and/or described
herein, specific terminology is employed for the sake of clarity.
The invention, however, is not intended to be limited to the
specific terminology so selected, and it is to be understood that
each specific element includes all technical equivalents that
10 operate in a similar manner to accomplish similar functions.

Referring now to **FIGS. 1** and **2**, the present invention is a motor
vehicle verification and control system 10, wherein on-board
microprocessor and receiver 20 is preferably installed and
15 communicatively linked to a vehicle's master computer 30. The on-
board microprocessor and receiver 20, or computer brain 22, receives,
preferably via at least one antenna 40, remotely generated and
preferably encrypted signals 50 such as, for exemplary purposes only,
analog, digital, G3, broadband, satellite, green light and/or
20 infrared signals, and preferably interprets signals 50 to determine
specifications for operation of a vehicle 32, wherein operation of
vehicle 32 may preferably continue, uninterrupted or per limitations
until expiration of a time period or until intervention by a
monitoring agency 60, wherein preferably vehicle master computer 30

becomes a slave, overwritten and controlled by computer brain 22 of motor vehicle verification and control system 10, and may be remotely disabled.

5 Preferably, on-board microprocessor and receiver 20, or computer brain 22, is communicatively linked to interactive license plate 70, wherein each such license plate 70 preferably has a digital identifier corresponding to the appropriately related computer brain 22 and is thus specific for a particular vehicle 32. Recognizing the
10 specificity, interactive license plate 70 could be appropriately installed during vehicle manufacture, by retrofit at the time of licensing or at any other time wherein appropriate authority and control is provided. If a replacement plate 70 becomes necessary, an appropriate monitoring agency 60 could so encode and notify the
15 appropriate computer brain 22 of the replacement.

Interactive license plate 70 preferably has remote infrared target 72 for directly disabling equipped vehicle 32. Preferably, the digital identifier provides a backup means for remotely disabling
20 equipped vehicle 32, wherein infrared target 72 is inaccessible or otherwise inappropriate. Preferably, to remotely disable vehicle 32, law enforcement authorities 60 may utilize the digital identifier to access a unique authority code permitting remote disabling of vehicle 32, wherein the unique authority code would be wirelessly transmitted

to on-board microprocessor and receiver 20 and a command communicated to motor vehicle computer 30.

On-board microprocessor and receiver 20, or computer brain 22,
5 may include towing module 80, wherein a trailer towed by vehicle 32 can preferably be monitored thereby and wherein vehicle 32 can preferably require authorization prior to being towed. Unauthorized towing of vehicle 32 preferably initiates a signal 50, or silent alarm, to monitoring agency 60, wherein proper response thereto would
10 be initiated.

Safety features incorporated into multi-component motor vehicle verification and control system 10 preferably include automatic deactivation following tampering with any component
15 thereof.

Preferably, on-board microprocessor and receiver 20 of motor vehicle verification and control system 10 can be remotely activated to enable locating, monitoring, controlling and disabling
20 of equipped vehicle 32 and can receive signals 50 such as, for exemplary purposes only, analog, digital, broadband, satellite (i.e. GPS), green light and/or infrared signals.

Preferably, motor vehicle verification and control system 10 has

a scanner 90, wherein a smart card driver's license could be scanned prior to operation of vehicle 32. Preferably, the smart-card driver's license is preprogrammed by authorities 60 to identify a driver and provide relevant information thereabout such as, for
5 exemplary purposes only, outstanding fines, warrants, previous arrests or driving record. Scanner 90 preferably communicates relevant information to on-board microprocessor and receiver 20, wherein the information is interpreted and vehicle operational and performance constraints such as, for exemplary purposes only,
10 limitations on speed, hours of operation and geographical boundaries of travel, are communicated to vehicle central computer 30, and wherein such constraints are preferably initiated. Scanner 90 also enables tracking and monitoring of commercial drivers and thereby ensures adherence to maximum hour per driver guidelines.

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Preferably, scanner 90 enables utilization of a credit, debit or variable value cash card for on-board payment of tolls, fines, parking fees and other charges by a vehicle occupant.

20 Preferably, scanner 90 is incorporated into an on-board display and scanner module with keypad 92 and display monitor 94, wherein motor vehicle verification and control system 10 provides authorities 60 with safe and direct contact with a vehicle operator via display monitor 94.

Keypad 92 preferably enables a vehicle owner to selectively limit operation of his or her vehicle 32 to specific individuals, a limited geographic area, a limited operational period, or limited speeds as desired. While input of such limitations and specification via keypad 92 is preferred, alternate means of input and programming known in the art could be utilized such as, for exemplary purposes only, display monitor 94 could have touch-screen programming capabilities or on-board microprocessor and receiver 20 could receive voice commands.

Motor vehicle verification and control system 10 preferably includes target 100 for receiving disabling digital and infrared signals and for enabling vehicle tracking via GPS, wherein target 100 is preferably installed on an exterior surface of equipped vehicle 32 such as, for exemplary purposes only, a roof, hood or trunk. Preferably, a law enforcement air support vehicle such as a helicopter can disable vehicle 32 by sending a signal 50 to target 100, wherein target 100 communicates receipt of signal 50 to on-board microprocessor and receiver 20 and wherein on-board microprocessor and receiver 20 enslaves vehicle central computer 30 and disables vehicle 32. Preferably, target 100 serves as a remote activator for remote devices such as, for exemplary purposes only, traffic monitoring cameras, thereby notifying appropriate authorities 60 of a

violation committed by vehicle 32.

Preferably, motor vehicle verification and control system 10 includes software for utilization by monitoring agency 60 and on-board microprocessor and receiver 20, wherein the software enables
5 monitoring agency 60 and on-board microprocessor and receiver 20 to transmit and receive preferably encrypted data such as, but not limited to, vehicle registration data, outstanding fees and fines, driver information, insurance details and vehicle tracking data. The
10 software is configured to interpret data and signal an appropriate course of action.

In an alternate embodiment, on-board microprocessor and receiver 20, or computer brain 22, is communicatively linked to interactive
15 auxiliary license plate 110, wherein each such auxiliary license plate 110 preferably has a digital identifier corresponding to the appropriately related and designated computer brain 22 and may thus be rendered specific for a particular vehicle 32 and exchanged and reprogrammed for another vehicle as necessary. Auxiliary license
20 plate 110 could be utilized wherein commercial carriers desire to remotely communicate data such as, for exemplary purposes only, weight, cargo, destination and originator to a weigh station or the like. Utilization of auxiliary license plate 110 could enable commercial cargo carriers to directly monitor or locate cargo. Like

interactive license plate 70, auxiliary license plate 110 could have a remote infrared target 112 for directly disabling equipped vehicle 32 and the digital identifier could provide a backup means for remotely disabling equipped vehicle 32, wherein the infrared target
5 112 is inaccessible or otherwise inappropriate.

In an alternate embodiment, a limited function, secondary motor vehicle verification and control system device could be provided to enable third party vehicle tracking, wherein direct notification to
10 monitoring authority 60 could result from unauthorized vehicle operation or from other inappropriate, predesignated actions. Third party users of alternate secondary motor vehicle verification and control system device could be interested parties such as, for exemplary purposes only, corporate owners, lien holders, insurers,
15 car rental agencies or guardians.

In an alternate embodiment, multi-component motor vehicle verification and control system 10 could enable monitoring agency 60 to limit access to the system monitored thereby, wherein rights could
20 be licensed for the manufacture of compatible peripheral devices such as, for exemplary purposes only, traffic cameras, speed and toll devices and of potentially integrated components such as, for exemplary purposes only, personal data assistants, cellular telephones and other wireless telecommunications devices. Such

licensed rights for peripheral devices could provide financial incentive and rewards for monitoring agency participation.

In use, on-board microprocessor and receiver 20, interactive
5 license plate 70 and scanner 90 are installed into vehicle 32. Preferably, monitoring agency 60 initiates monitoring of vehicle 32. Scanner 90 preferably reports detailed information to monitoring agency 60 regarding an operator of vehicle 32, wherein if operational limitations are appropriate, a signal is sent to on-board
10 microprocessor and receiver 20 and vehicle 32 responds. If disabling or tracking of vehicle 32 becomes necessary, monitoring agency 60 can remotely follow and disable vehicle 32 by either relying on interactive license plate 70 or via signals to and from on-board microprocessor and receiver 20. If monitoring agency 60 requires
15 contact with an operator of vehicle 32, on-board display monitor 94 enables safe and direct communication.

Having thus described exemplary embodiments of the present invention, it should be noted by those skilled in the art that the
20 within disclosures are exemplary only, and that various other alternatives, adaptations, and modifications may be made within the scope of the present invention. Accordingly, the present invention is not limited to the specific embodiments illustrated herein, but is limited only by the following claims.